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PATHOLOGICAL ANATOMY

CONSIDERED IN ITS RELATION TO

MEDICAL SCIENCE,

BEING

AN ADDRESS

DELIVERED AT THE ROYAL CORK INSTITUTION,

INTRODUCTORY TO A COURSE ON

PATHOLOGICAL ANATOMY AND HISTOLOGY,

BY

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MDCCCLII.

TO

THEODORE E. LADD, M.D.,

THE FELLOW-STUDENT, FRIEND, AND BROTHER

OF

THE AUTHOR.

The Student has to look forward to a future in which his accomplishments must be of even a higher order than those required by the present generation—age after age extends the acquirements expected from those who practice Medicine—the necessity for Pathological and Histological knowledge is beginning to be admitted, and those who are to "fill our vacant places," should be convinced of its utility—for this purpose the following Address was delivered; while, with all its imperfections, I venture on its publication, in the hope that it may help to bring the subject under the attention of those who regulate the curriculum of Medical Education.

ADDRESS.

We are here to-night, Gentlemen, to open, for the first time in the South of Ireland, a course of Lectures on Pathological Anatomy, with Microscopic demonstrations; surely, then, some explanation and apology is required, when a junior member of the Profession appears before his Seniors and the Public, to demonstrate the necessity for, and undertake the conducting of, so novel and important a course. At an early period of my studentship my attention was directed to the marks left by disease, and I endeavoured to avail myself of the opportunities afforded for their study, in the Hospitals of this city. In the Dublin Schools of Medicine I hoped to find the kind of information I most anxiously desired, but, with the honourable exception of the Pathological Society (whose meetings are ever open to the Student), pathological teaching was conducted on the same principle as in the school I had just left, viz., the physician under whose care the patient had been, offered some remarks on the case while his clinical clerk made the *post mortem* examination; then the most apparent of easiest demonstrated morbid appearances were exhibited and the diagnosis verified; but, Gentlemen, it cannot be considered as teaching Pathological Anatomy, to show a lung presenting this or that lesion which had been most accurately diagnosed, and then to hear, "it is unnecessary to open the abdomen as there is sufficient disease in the thorax to account for the symptoms and fatal termination." Let us for a moment put this assertion to the test; to-day a lung is shown, so destroyed by tubercular disease, that it were difficult to find a trace of its normal structure; to-morrow another lung is laid before the class presenting a few tubercles scattered through it, and a cavity large enough to admit a nut at its apex—in both cases the symptoms and death are presumed to be fully accounted for; but let us inquire, why did not the individual from whom the last lung was taken live until the organ would present the same amount of lesion as in the former case? Why did this man live so long, and that one die so soon? Why was the appetite in this case almost ravenous, even to the hour of death, and why had the latter so little desire for any kind of food? How are we to explain that the cough was only occasional in the former, while in the latter it formed the chief subject of complaint? How explain that diarrhæa weakened one, while no such symptom occurred in the other? Inquiries such as these were not answered by the mere examination of the thorax: would not these apparent anomalies have been explained had the contents of the abdomen and head been examined?—at least it were worth the trial—had Louis rested satisfied with such partial investigations, his book on Phthisis would have been a manual, not a philosophical treatise, answering almost every inquiry that the minds of his readers may suggest. Again, a man falls from a height: he is taken up dead; the skull has been fractured—this caused the sudden death. But fractures far more extensive, and in the same position, occur, yet the patients recover. M. Legallois, however, has experimentally demonstrated, that if the point of origin of the pneumogastrics from the medulla oblongata be injured, instantaneous death is the result; this part was not examined, and if it had been, would the rupture of a few fibres of the cord explain the immediate death of both the sensatory and motor systems? That such an injury is on the instant fatal in almost all classes of animals, Flourens has fully shown. A case of Diabetes, after being for months in hospital, dies: the viscera are carefully examined, found perfectly healthy, and the only explanation that can be offered is, that he died of Diabetes; in other words, he died of the symptoms denominated by that term. But as our idea of disease is essentially connected with a cause known or unknown, a symptom, and an alteration or lesion of some organ, our inquiries should be directed to discover how the cause produced the lesion, and how it in its turn developed the symptom we have observed. I may be told, however, that in this instance such examinations are needless, for cases of diabetes have been again and again examined without organic change being found. Before we can admit such an assertion, we should inquire, was the state of the pancreas investigated—was the medulla oblongata healthy? for M. Claud Bernard has proved that puncturing the corpus olivaria, between the origin of the acoustic and pneumogastric nerves, produces diabetes in animals; but it remains for Pathology to test the value of this discovery, and to apply it to the explanation of the phenomena observed during life. Again, injury or puncture of the medulla, at a point not yet accurately defined, causes albumenuria: how great a change this discovery may yet produce, in the value of this sign as indicative of renal disease, clinical observation has yet to determine. The recent experiments of M. Melsen* have rendered it more than probable, that albumen exists in the fluids of the body under more than one condition, and that the presence of salts in the fluids materially modifies the action of the usual tests for this substance; his elaborate investigations will ere long be laid before you by Dr. Lyons;† and I am enabled to corroborate M. Melsen's statement, as I have failed in producing some of the most remarkable phenomena presented by albumen in solution, while experimenting on a highly albuminous fluid, drawn from a case of ascites.

In making these remarks, nothing can be farther from my intention than to disparage the Irish School of Medicine: one who has heard the names of the founders of that school in the mouths of students of all nations, like Household Words, would be the last to doubt the superiority of their minds and the practical value of their observations; as vain were it for me to endeavour to lower your opinion of our school as it is unnecessary to pass encomiums on those whose names stand high on the lists of science and humanity, and I should be ungrateful did I not acknowledge, that it is to Drs. Bennett and Gairdner o Edinburgh I am indebted for accurate and general ideas on this important subject, as also for my first instructions in the use of that instrument, without which we cannot obtain a perfect knowledge of this department of Medical Science, and non-microscopic descriptions of the anatomical lesions caused by disease are of that character which, though valuable some years past, are far behind the present state of science, and therefore unfitted for the age in which we live. Having, then, obtained in Edinburgh that essential element in all education, namely, instruction that brings the student up to the present state of knowledge, opportunites for continuing this study offered themselves to me, such as at present are not to be had at home. Returning to Dublin in last October, right glad was I to find, that the only branch of medical education not hitherto represented in Ireland had found a strenuous and able advocate, and that the Microscope had been brought within the reach of the students in this country by Dr. Lyons, whose "Apology for the Microscope," and articles in the Dublin Quarterly Journal are too well known and appreciated to require comment from me. Oft times, when my thoughts wandered homeward, I have felt assured, that the stimulus given to Medical education in this city by the establishment of the Queen's College, would ere long develope the necessity for special instruction on this subject, and that a course of Pathological Anatomy would be opened to, and gladly availed of by the students, whose increasing number proved, that Irishmen fully appreciated the advantages to be derived within th e walls of the new Colleges. Had this expectation been accomplished, my appearance here to-night would have been as unnecessary as presumptuous, and on the fact, that no one has come forward to teach the student the value of Pathological Anatomy, must rest my excuse for attempting to occupy a place, which no one seemed desirous of filling.

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* Ext. du tome xviii., No. 7, des Bulletins Acad. Roy. de Belgique.

† Dublin Quarterly Journal of Medical Science, Feb. 1852.

It now becomes my duty to enter into some historical details. The privilege of examining the dead was not allowed to the fathers of medicine, hence their investigations were of necessity confined to the lower animals, and we find Bonetius(*a*) frequently referring to such researches. Pliny(*b*), as referred to by Morgagni, Ded. Epist. lib. ii., informs us that in Egypt, under the Ptolemies, Herophilus and Erasistatus were permitted to examine the bodies of men, and some centuries after the physicians in Constantinople, during a plague, were allowed to search in the bodies of the dead for the cause, and thereby endeavoured to explain the symptoms.(*c*) Among the Moderns, according to Morgagni(*d*), it was first studied in Italy, and we are indebted to Benoit and Beniveni for many observations thereon. Jacobus Carpius(*e*), a few years after, palpably put forward the claims of this science; his example was followed by Massa(*f*), Fallopia(*g*), Eustachius(*h*), and we find the works of Lælius a Fonte and Panoroli referred

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a. Sepulchretum Siva Anat. Practica, Geneva, 1700. Lib. I., sec. viii.

b. I am unable to verify this quotation from lib. 19, sec. v. Hist. Nat.

c. See Historia Medicinæ a tempore Galeni usque ad initium sœculi Decimi cexti. Page 336, et seq., for an account of the Medical Schools of Alexandria, &c.

d. Ded. Epis. lib. ii.

e. Friend mentions in his Hist. Med., page 585, that Carpius made a hundred human dissections—"quæ res utpote istis temporibus inusitata existimatur mira et crudelis (vix credibilis?)."

f. Liber Introductorius Anatomiæ. Venice, 1536.

g. Opera Genuina Omnia. Venice, 1559.

h. Opuscula Anatomica. Venice, 1563.

to by Stahl. To them followed Vesale(*a*), Coiter(*b*), Spigelius(*c*), Bartholinius(*d*), Valsalva(*e*), Van Horne(*f*), and many others who studied at Padua.

In Germany, Hoffman(*g*), Boerhaave(*h*), Camper(*i*), and Haller(*k*), devoted part of their time and works to the elucidation of this subject, while Sylvius(*l*), Fernel(*m*), and Paré(*n*) in France; and in England Harvey(*o*), Glisson(*p*), Willis(*q*) and Mead(*r*), lent their aid in forming the new science; but unfortunately many of their works have disappeared, and some of their names are known to us only through reference made to them by more modern authors. Vesale's name is especially connected with all allusion to the past, as he had collected materials for, and even begun, a work on this subject, the completion of which he relinquished, disgusted with the envy and persecution of those who, as Fontenelle, in the preface of his "Histoire de l'Académie Royale des Sciences, 1699," informs us, "judged that what they did not themselves possess was superfluous

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a. Opera Omnia Anatomica et Chirurgica. Lugd. Bat. 1725. The plates with which this edition is illustrated are fine specimens of art.

b. Tabulæ Principalium Humani Corporis Partium, &c. Norib. 1573.

c. De Hum. Corp. Fabrica, 1627; and Opera Omnia, Amsterdam, 1645.

d. Institutiones Anatomicæ. Ludg. Bat. 1645.

e. Opera Omnia. Venice, 1740.

f. Opuscula Anatomico-Chirurgica. Leipsic, 1707.

g. Opera Omnia Physico-medica. Geneva, 1748.

h. Methodus Studii Medici. Lugd. Bat. 1751.

i. Demonstrationes Anatomico-pathologicæ. Amsterdam, 1760.

k. Disputationes ad morborum historiam et curationem facientes. Lausanne, 1757 and 1766.

l. Morborum Internorum Curatio. Paris, 1545; and Opera Medica, Geneva, 1630.

m. De Abditis Rerum Causis. 1548. This work passed through 30 editions.

n. Œuvres Complétes, par M. Malgaigne. Paris, 1840.

o. Excitatio et Nat. de Motu Cordis et Sanguinis circulatione. 1628.

p. Opera Medica Anatomica. Lugd. Bat. 1691.

q. Opera Omnia Medica. Sugd. 1679.

r. Opera Omnia. Gottingen, 1749.

in others.(*a*)" Eustachius also, who as physician to an hospital had great opportunities for such investigation, lamented that illness prevented him from completing a work he had begun—while Coiter and Columbus(*b*) followed the example of their great master Vesale, and we find repeated references made in their works to the examinations they had conducted. At Geneva, in 1673, Bonetius published his Sepulchretum Anatomicum, in which he collected all the observations that had been made for years before. Nearly another century had passed when Morgagni gave to the world his great work, and with the Sedibus et Causis Morborum, first published at Padua in 1761, began a new epoch in this science, if indeed it can be considered to have existed as such before he wrote, and he pleaded as excuse for its appearing so slowly, that he was nearly eighty years of age when he revised the entire, and earned the high honour of being considered by posterity as the father of Pathological Anatomy. Lieutard(*c*) continued the same kind of researches, and in 1791 Vicq. d'Azyr wrote the article on this subject in the Encyclopédie Méthodique, which is as learned as it is immense, and will be referred to by all investigating the history of that science on which Baillie(*d*) published his book in 1793, and thus closed the past century. Since 1800 the progress of this department has become so incorporated with that of medicine, that it will only be necessary to mention the names of the authors to

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a. Quoted by Morgagni, Ded. Epis. lib. ii.

b. De Re Anatomica. Venice, 1559.

c Historia Anatomico-medica, sistens numerosissima cadaverum humanorum extispicia. Paris, 1767.

d. The morbid Anatomy of some of the most important parts in the human body. 1793. The seventh edition appeared in 1807 recall their labours to your recollection. In England, Hewson, Carswell, Bright, Hope, Gulliver, Paget, Walshe, Simon, Jones; in Scotland, Monro, Hunter, Reid, Craigie, Goodsir, Bennett and Gairdner have successfully endeavoured to place British Pathology on a par with that developed in France by Portal(*a*), Bichat(*b*), Louis(*c*), Broussais(*d*), Andral(*e*), Cruveilhier(*f*), Lobstein(*g*), Rayer(*h*), Lebert(*i*); and in Germany by Meckel(*k*), Van der Kolk(*l*), Scherer(*m*), Puchelt(*n*), Vogel(*o*), Rokitansky(*p*), Henle(*q*), Gluge(*r*), Kölliker(*s*) and Förster.(*t*)

But why should an Irishman mention the works of his countrymen last—even our proverbial modesty would scarcely justify it; but the light we have thrown upon Diagnosis and Practice, serves but to make us feel more forcibly the contrast between the high position our school holds in these departments, and the unaccountable total absence of original scientific investigations, on a

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a. Cours d'Anatomie Médicale, avec des remarques physiologiques et pathologiques. Paris, 1804,

b. Anatomie Pathologique. Paris, 1826.

c. Mémoires ou Recherches Anatomico-Pathologiques, &c.. Paris, 1826.

d. Cours de Pathologie et de Thérapeutique générales. Paris, 1829-34.

e. Précis d'Anat. Pathologique, Paris, 1829; and Clinique Méd. 1840.

f. Anatomie Pathologique du Corps Humain Paris, 1830—1842.

g. Traité d'Anatomie Pathologique, 2 vols. 1829—1833.

h. Traité des Maladies des Reins, avec Atlas, 3 vols. 1839.

i. Physiologie Pathologique, avec Atlas, 2 vols. 1845.

k. Handbuch der pathologischen Anatomie. 1812.

l. Observat. Anat. Path. 1826.

m. Chem. und Mikroscop. Untersuchungen zur Pathologie.

n. Das Venensystem in seinem krankhaften Verhältnissen dargestellt. Leipzig, 1843.

o. Icones histologiæ Pathologiæ. Leipzig, 1843.

p, Handbuch der pathologischen Anatomie. 1841—1846; and translated for the Sydenham Society, 1849—1851.

q. Handbuch der rationellen Pathologie. Brunswick, 1846.

r. Atlas der pathologischen Anatomie. Jena, 1843—1850.

s. Mikroskop. Anat. oder Gewebelehre des Menschen. Leipzig, 1850.

t. Lehrbuch der pathologischen Anatomie. Jena, 1850.

branch of research which has engaged the attention of some of the highest intellect in other countries. To what department of Scientific Medicine has not Mosse, Dun, Carmichael, Curran, Crampton, Graves, Stokes, Montgomery, Barker, Allman, Wilde, Kane, Aldridge, Sullivan, and other honoured names, added original and highly valuable observations? There is one exception to the long list of subjects which their genius has served to elucidate, and that is Pathological Anatomy considered as a Science, for no work on this subject has as yet issued from the Irish Press. True it is, that by avoiding the too theoretical tendency of foreign intellect, we have escaped the reproach of having ever given even temporary support to theories, that have not stood the test of time, or the still severer test of experience, yet while we may congratulate ourselves on having thus avoided Broussaism, Brownism, Humourism and Solidism, while Hydropathy and Hœmeopathy can with difficulty find an individual to espouse their cause, let us not rest in self-satisfied complacency, conscious of the high practical tendency of our School, and let it be remembered, that such general fallacies contain a certain, though a small, amount of truth, which is too often the basis on which is heaped a mass of error, as illogical as it is dangerous. For example: how greatly we are indebted to Broussais for having drawn attention to facts in Pathological Anatomy, which but for him would probably have long remained unknown, yet carried away by the spirit of the times, and by the striking character of his discoveries, he fell into the error of asking from the science to which he had imparted new life, what alone it could never grant, namely, the explanation of all the phenomena of disease; for, as the scalpel can only reveal the changes in the solids, he lost sight of the fluid elements of tissue. We should keep constantly before us, that what is to-day purely scientific may be to-morrow highly practical, and that the apparent importance of a discovery forms no criterion whereby to judge of the advantages to be hereafter derived therefrom; for instance, a galvanic current was passed through a galvanic needle—it was seen to deviate from its usual position; here was a discovery of a purely scientific interest, the practical application of which has rendered it so intimately connected with the interests of society, that the advantages it has conferred on mankind are almost incalculable. A purely practical or exclusively theoretical system of medical education is injurious; like an acid or alkali, when apart, hurtful to a well-organized being, but like them, when combined, forming a compound perfectly free from the injurious tendency of either. Some of my hearers may consider, that Theory is only useful to explain what cannot be reduced to demonstration, but it has to accomplish a far higher purpose; it forms the nucleus, so to speak, around which stray facts accumulate, from which they derive their importance, and to which they are frequently indebted for their full developement. A theory carries with it defenders and opponents, and though at first sight their exertions may appear to have a directly opposite tendency, still they labour to attain the same object; for, to defend we must observe—to oppose we must observe—to argue successfully we must refer to the discoveries of others, and confirm or refute them by our own observations. It is by the conflict of mind against mind, that science is advanced, and on what ground is that contest so oft renewed as on the wide field of Theory, where observation ever comes to the rescue of truth. What the Newtonian and Atomic theories have done for the other sciences, the Cell or Cytogenic theory has done for Physiology and Pathology; for, as facts accumulate, the necessity for some means whereby their connexion and relation to one another may be demonstrated, and their relative value appreciated, becomes apparent, and on this their importance depends. The changeable character of theory has been again and again put forward as conclusive proof that it forms an injurious and even dangerous element in scientific education, yet it is on its Protean quality that its value in a great measure depends; it changes with the varying character of science, and is thus enabled to adapt itself and become useful to a variety of circumstances. I speak not of the finely-wrought theory, that is too often applauded, like the actor in Horace, before it has in any way merited such approbation, but of that based on, and deduced from, observation and experiment. There is nothing useful but may be abused; hence, theories whose use in medical science should have been confined to showing the connexion between lesions and symptoms, have been carried beyond their proper limits, and applied to Practice before they had received the impress of truth. The theological and metaphysical stages through which medicine, along with the other sciences, has passed, represent the reign of theory or rather of dogmatical assertion, while it has now entered upon its third stage, the observative and inductive, thereby combining the two elements necessary for its success.*

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* M. Roban describes three stages, the Theological, Metaphysical, and Positive.—Du Microscope, Deuxieme Partie; Page 18. Paris, 1849. See also, Cours de Philosophie Positive, par M. Comte.

The claims of theory having been thus brought before your notice, we shall next proceed to define what is the object of the researches conducted under the name of Pathological Anatomy, which Förster defines, as, "the science of the exact form of diseased change considered from a general point of view; while special Pathological Anatomy is the study, of the phenomena in regular succession as laid down in the special organ or tissue, and Physiological Pathology is the search after the order in which these changes occur, and the cause which produces a certain effect." But ther must be some limit to this kind of investigation; defining it to be the science of the physical deformities of the solids and fluids that compose the body, expresses that the legitimate object of Pathological Anatomy is the study of the alterations of *form*, and when we go beyond this limit we pass into the region belonging more properly to chemistry. Still it must be observed, that certain substances are alike subject to the investigations of the chemist and the pathologist; to this class belong Fibrin, Albumen, Casein, &c.; these require to be examined from many points of view, and every day is rendering more frequent these most profitable reunions of the sciences. One of the reproaches cast on the practice of our profession is, that it is empirical and not entitled to be considered as a science, because it does not explain by what means, what we presume to be causes, produce what we state to be effects; this, in a measure, merited reproach, is removed by making Pathological Anatomy a part of Medical education; it supplies the deficiencies in medical reasonings; it deals with facts which can be demonstrated, and thus forms a basis for logical deductions. It may, however, be suggested, that there is no necessity for a special course on this subject, as it is taught in the Lectures on Practice of Medicine and Surgery, and in the Hospitals. To meet this objection I will bring forward the axiom, that the most profitable course of reading, and the only one by which a thorough acquaintance with disease can be obtained, is by the study of monographs; this once admitted, it is unnecessary to occupy your time by entering into particulars to prove, that a course of lectures, with demonstrations, on any special subject, is equivalent to a monograph; and further, if it be on a department of medical science requiring manipulation, it supplies that which cannot be learned from books. No one wishing to become acquainted with Aural or Opthalmic Surgery, would rest satisfied with the necessarily short remarks made on those diseases in a course on the practice of Surgery, and Irish Medicine owes a debt of gratitude to Mr. Wilde for having opened a course of special instruction on these subjects. Would the student desirous of an intimate knowledge of diseases of the chest, content himself with reading the more or less abridged account of these affections to be found in the class books on the Practice of Medicine, and are we not justly proud, that from the Irish school has emanated the best monograph on these diseases that has appeared since the time of Laennec. If then it be true that we must study disease separately as well as collectively, how much more forcibly does it apply to that branch of science which includes within its embrace the lesions produced by the entire category of diseases. How unnecessary would be these remarks in England, Scotland, France, or Germany; they would be considered as belonging to an age long since gone by—arguments whose force has been admitted, and suggestions that have been for years put in practice. Every college and school aiming at celebrity has attached thereto a Chair of Pathological Anatomy, ably filled, well attended, and productive of the greatest benefit to science. Every department of Medicine has its professor in our University and in the Queen's Colleges, save that to which I venture thus to draw your attention; and have we not every reason to believe, that the founding of a Chair on this subject would tend to impart a more decidedly scientific tone to these institutions, and place them in a more favourable position to compete with similar establishments in the sister country.

Having endeavoured so far to prove the necessity for such knowledge, let us now inquire how it is to be obtained. Among the works of those who have devoted special attention to this subject, and should be carefully studied, are Vogel's Pathological Anatomy translated into English by Day, Otto's Human and Comparative Anatomy by South, and Lebert's Physiologie Pathologique. On the Pathology and Microscopic appearances of Tubercle, the works of Louis (*a*), and Lebert (*b*), may be consulted with advantage. The literature of Cancerous affections is to be found in the monographs of Walshe (*c*), Bennett (*d*), and Lebert (*e*). Renal pathology has been fully treated of by Bright (*f*); Christison (*g*),

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a. Recherches Anatom. pathol. et thérap. sur la Phthisie. Paris, 1843.
b. Traité Prat. des Maladies Scrofuleuses et Tuberculeuses. Paris, 1839.
c. On Cancer. London, 1846.
d. On Cancerous and Cancroid Growths. Edinburgh.
e. Traité Pratique des Maladies Cancereuses. Paris, 1851.
f. Report of Medical Cases. London, 1827.
g. Treatise on Granular Disease of the Kidney, Edin., 1838.

Rayer(*a*), Prout(*b*), Johnson(*c*), Bird(*d*), Gairdner(*e*), and Rees.(*f*) Hepatic disease has been investigated by Annesley (*g*), Thompson (*h*), and Budd (*i*) ; M. Piorry(*j*) has brought to light many facts regarding the spleen, but the pathology of this and the other blood glands has not been made the subject of any special treatise ; however, the works of Simon(*k*), Kölliker(*l*), Sanders(*m*), and Jones(*n*), have made us acquainted with their minute structure, and Dr. Bennett's recent and highly valuable observations on Leucocythema, or white cell-blood, has opened a new field for pathological research. The Pathological Anatomy of the nervous system is comprised in the works of Abercrombie(*o*,) Lallemand(*p*), Grainger(*q*), Marshall Hall(*r*), Hannover(*s*). Pinel(*t*), Solly(*u*), Bennett(*v*), and Todd(*w*). The heart, arteries, and veins form the subject of the

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a. Traité des Maladies des Reins. Paris, 1839.
b. On Stomach and Urinary Diseases. London, 1841.
c. Medico-Chirurg. Review, page 193. 1836.
d. On Urinary Deposits. 3rd Edit. London, 1851.
e. Gairdner on the Pathology of the Kidney. Edin. 1848.
f. On the Nature and Treatment of Disease of the Kidney, connected with Albuminous Urine. London, 1851.
g. Researches on the Diseases of India. 2nd Edition.
h On Diseases of the Liver.
i. On Diseases of the Liver.
j. Traité de Médecine Practique, Vol. 6. Paris, 1845.
k. Physiological Essay on the Thymus Gland. 1845.
l. Art. Spleen, Cyclop. Anat. and Phys.
m. On the Structure of the Spleen. 1851.
n. Arts. Thymus and Thyroid Gland, Cyclop. Anat and Phys.
o. Pathol. & Pract. Researches on the Brain & Spinal Cord. Edin. 1845.
p. Recherches Anat. Path. sur l'Encéphale. Paris, 1836.
q. On the Spinal Cord. 1837.
r. Diseases and Derangements of the Nervous System. London, 1841; and Treatment of Apoplexy and Paralysis. London, 1851.
s. Microscopic Researches on the Nervous System. Copenhagen, 1844.
t. Traité de Pathologie Cérébrale. Paris, 1844.
u. The Human Brain, its Structure, Physiology and Diseases. Lon. 1847.
v. Edin. Med. and Surg. Journal, Vols. 1842—43.
w. Medical Gazette, 1849 and 1850.

researches of Breschet(a), Hope(b), Puchelt(c), Dubrueil(d), and Crisp(e) ; the blood and other fluids have been examined by many, the most remarkable being Gulliver(f), Andral and Gavarret(g), Rees(h), Griffith(i), Paget(k), Jones(l), Sanderson(m), and Bennett(n) ; while Hasse(o) has added to our knowledge of pulmonary lesions.

But Pathological Anatomy cannot be learned from books alone, practical knowledge is still more necessary, and cannot be attained without the examination of diseased parts ; to become Pathologists requires the exercise of our senses and the use of the mechanical aids, by which the field over which these senses can act is enlarged, and as we are dealing with a science of form the senses of feeling and seeing are most directly called into action, especially the latter. How much can be done by the unaided eye, the works of Morgagni, Hunter, Rokitansky and Crüveilhier sufficiently prove, and if the power of this organ was increased, ought not the results obtained thereby be in a similar proportion ;

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a. Mém. Chir. sur les différentes espéces d'Anévrysmes. Paris, 1834.
b. On Diseases of the Heart. 1839.
c. Das Venensystem. Leipzig, 1843.
d. Des Anomalies Artérielles. Paris, 1847.
e. Diseases of the Blood Vessels. London, 1847.
f. Lond. and Edin. Phil. Mag., Vol. 16. 1840.
g. Rech. sur les modifications de proportion du Sang dans les Maladies. Paris, 1842.
h. On the Analysis of Blood and Urine in Health and Disease. 1845.
i. Chemical and Microscopic Characters of the Blood. 1846.
k. Kirke's Handbook of Physiology ; 2nd edit. page 46 ; Med. Gaz. 1849.
l. On the State of the Blood and Blood-vessels in Inflammation. Guy's Hospital Reports, Vol. vii., page 1.
m. On the Metamorphosis of Coloured Blood Corpuscles. Monthly Journ. Med. Science, Sept. 1851.
n. On Leucocythemia, or White Cell Blood. Edin. 1852.
o. Anatom. Descrip of the Diseases of the Organs of Circulation and Respiration. Transl. for the Sydenham Soc. by Dr. Swaine. Lond. 1846.

could our vision penetrate into the interior of this earth, the state of matter in its centre would be a demonstration and not a deduction; but man's ingenuity would not have been called so forcibly into action had our senses been more exalted; thus, the Creator has conferred on man the most unalloyed class of enjoyments, namely that derived from the exercise of his mental faculties, by setting narrow and well defined limits to our senses, while He implanted within us the wish to improve—man used his senses and found them too weak to satisfy his longings after the Unknown—he invented instruments—then the word World found its plural and Astronomy was ranked among the sciences—time rolled on and Leeuwenhoek began the sublime demonstration, that his Creator is as great in littleness, as he is great in greatness, as infinite in the formation of a cilia and giving to it the laws that regulate its vibrations, as when he called worlds into being and gave their course to the satellites; are we not then highly culpable if we neglect using the means put within our reach, and shall we refuse to become acquainted with any instrument that has conferred benefits on mankind. The zeal and success with which Irishmen have studied the Stethoscope as used by Laennec, forms a striking contrast with their neglect and ignorance of the Microscope, Zausz's instrument; and it has been pleaded as excuse for our apathy, that except in renal affections the Microscope has not been useful in the study of disease in the living, and therefore it is not worth the attention of the practical physician whose object is to treat the sick, and cannot devote his time to mere scientific pursuits, under which head microscopic investigations are classed. Let me ask, "in what class of disease, except those of the lungs and circulatory apparatus, has the Stethoscope been useful?" Are we then to neglect the use of an instrument because it is only applicable to the diagnosis of the diseases of one organ; here we have to deal with an assertion, which while admitting its usefulness, declares it unworthy of the attention of those whose efforts are directed to cure or relieve, and while its application to the study of renal diseases has been as yet its greatest practical triumph, those who keep pace with the progress of science cannot but feel, that it is daily extending its sphere of usefulness, daily aiding us more and more in diagnosis, and thus enabling us to treat successfully.

In order to shew the practical value of microscopic investigations, allow me to lay before you a few facts, of such a character as will, I trust, bring conviction to the minds of all who are desirous of seriously considering its claim to the attention of those, whose high mission is to relieve the ills of suffering humanity.

Affections of the scalp are perhaps the most difficult class of skin diseases to diagnose or treat successfully, and charlatans have derived no small amount of profit from the number of infallible remedies reported to cure the Porrigo favosa and lupinosa of Willan (scald head, as it is commonly termed), which has long been one of the affections that has resisted the best medical treatment. Bassi discovered that the disease called Muscardine in silk-worms, was caused by the growth of a very low form of parasitic plant. Hannover observed a species of Leoptomitus on the mucous membrane of the mouth and tongue of two patients suffering from typhoid fever; also on the apthæ of infants, on the mucous membrane of the œsophagus, and even in the bladder. Schönlein of Berlin, was the first to assert the vegetable origin of Porrigo, which has been confirmed by Fuchs, Remak, and Roban, while Gruby, Lebert and Bennett have made on it further investigations, rendered most valuable by the engravings of the microscopic appearances, and in 1845, the latter succeeded in inoculating the disease in the human subject, thus removing all doubt of its vegetable origin; the microscope has, in this instance, enabled us to form correct pathological ideas of the disease, and thus to arrive at its successful treatment.* The presence of albumen in the animal fluids and secretions has been found to play a most important part in modifying our opinions of the causation of many diseases, and forms a leading therapeutical indication; the name of Dr. Bright will be handed down to posterity connected with this highly valuable discovery in renal pathology, and he has pointed out the value of this symptom, in its relation to effusion into the serous cavities, especially of the arachnoid. The following means of research, then, though not microscopic, may be here alluded to as belonging to the same class of inquiries. M. Becquerel having experimented on 150 specimens of serum from the blood, and on 50 pathological fluids, has arrived at the following conclusions:—1st, That the albumen held in solution by serum and other organic fluids, causes the plane of polarization of a transmitted ray to deviate to the left. 2ndly, That the degree of deviation is proportionate to the amount of albumen contained in the liquid, and that by means of the angle its quantity may be directly calculated. 3dly, That the "molecular rotative power" for albumen is about 27° 36′, and that in examining a fluid each minute of rotation may be held equivalent to 0.18 parts of albumen per thousand. The possible error of observation does not exceed four or five minutes, and hence, cannot affect the calculated result by more than one decimal part per thousand—a degree of accuracy which cannot be obtained by any other mode of examining albuminous fluids. But to return to strictly microscopic investigations, I may refer to a case mentioned to me by Dr. Bennett, and since published.* A gentleman consulted an eminent surgeon in London for a difficulty he experienced in swallowing, and on examination, a swelling was discovered deep in the pharynx, which after consultation was considered to be an abscess, and was about to be opened; however, while passing his finger far back into the pharynx to ascertain its exact position, the surgeon found on withdrawing his hand that something of a thicker consistence than mucus adhered to his nail, having been evidently scratched off the sides of the swelling in making the necessary manipulations; he immediately went to Mr. Quecket, of London, who after careful microscopic examination, declared it to have been taken from a surface undergoing cancerous transformation. The surgeon wisely refused to operate on the supposed abscess, and after death a cancerous tumour was found in the place occupied by the swelling. The practical value of such a discovery needs no comment.

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* For further particulars, see Sobernheim's Elemente der allgemeinen Physiologie, page 88. 1844.

Dr. Bennett and Mr. Cooper have drawn attention to the method of ascertaining the nature of a tumour by passing into it an exploring needle and examining what adheres thereto, as has been proposed by Küss of Strasbourg, and alluded to by Dr. Lyons;* but it appears to me, that the value of such a mode of investigation is by no means confined to the advantages to be derived from a knowledge relative to the tumour itself; medicine as well as surgery may be advanced by our obtaining an accurate idea of the nature of a tumour; for example, one of the most difficult diagnosis of thoracic disease is that of cancer of the lung, and Dr. Stokes has long since pointed out the existence of cancerous tumours on any part of the body as aiding us most materially in arriving at its diagnosis. But how are we to ascertain whether a tumour occurring in such a case is fatty, fibrous, scrofulous, melanotic or cancerous? simply by the procedure above described, which changes conjecture into certainty. Dr. Simpson has brought the exploring needle before the Obstetrical Society of Edinburgh as a means of diagnosis in some doubtful cases of pelvic abscess, ovarian and other tumours existing about the cervix uteri, the cystic or other nature of which it was otherwise impossible to determine.† Even after a tumour has been removed, its microscopic examinations should never be neglected, as there is still a solution reqiured to the following proposition— what are the probable chances that a cancerous growth removed from the body will appear after a certain time in some other part? This question might be asked of all kinds of tumours, and we could state what were the chances of permanent cure after their removal, on principles more fixed than the *ipse dixit* of a surgeon, if those connected with Hospitals followed the example of Mr. Cooper,* who, in his valuable Paper on "The application of chemical analysis and microscopic examination of morbid products to the formation of a correct diagnosis," has brought forward many highly instructive cases—one in which he drew off twelve ounces of limpid fluid from an enlargement situated on the right gluteal region; chemical analysis shewed that the liquid contained chloride of sodium and a small quantity of phosphate of lime, in proportions so exactly coinciding with those of the fluid of the spinal cord, that he was at first led to suspect some communication between the tumour and the vertebral column; but the microscope took up the examination where chemical investigation had failed, and numerous echinococci found in the fluid, proved the tumour to be dependant on the developement of hydatids. In another case the presence of biliary matter, and the remains of some half digested muscular fibres, both found on microscopic examination, proved that the abscess from which the fluid was taken communicated with the bowel, which was afterwards rendered certain by the passage of the contents of the intestine through the opening; many other examples of the value of microscopic investigations in the diagnosis of disease are recorded in this article. Mr. Paget† has established the connection between apoplexy and fatty degeneration of the small vessels of the brain, and Dr. Addison drew the attention of his clinical class, last winter, to the fact discovered by Dr. Gull, that the fluid in cases of abdominal dropsy, is often full of oil globules; its connection with the disease of some organ cannot be doubted, but its relation to diagnosis remains yet to be proved. Lastly, Van der Kolk* has observed, in the expectoration of phthisical patients, the elastic fibres which surround the cells of the lungs; under a power of two hundred diameters they appear arched, very thin, with sharp borders, at times covered with fat, which ether removes, and he cautions us against confounding them with a species of conferva which forms rapidly in the expectoration, especially when it contains fat; but the ramifications of the conferva, terminating in tumified cells, distinguishes them from the elastic fibres, and these last are seen most certainly when the tubercles begin to soften; this sign, therefore, is the more valuable, as it is best marked when most required, namely, at an early period of the disease. I cannot leave this part of the subject without drawing your attention to a Paper by Dr. Taylor, in the November number of Guy's Hospital Reports for 1851, entitled, "Remarks on death from strangulation," in which you will find a detailed account of the application of the microscope to the discovering whether stains found on the clothes of a prisoner were caused by blood or dye-stuffs, and whether it was human blood or that of animals. To conclude, Dr. Redfern, in his "Researches on Articular Cartilages," has brought forward many facts to prove, that the pain which has been stated by the highest authorities to be indicative of disease of the articular cartilages, is to be

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*For this and similar cases see Lectures on Clin. Med., part 5. Edin. 1851.

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* Apology for the Microscope, page 34.

† Monthly Journal of Medical Science, vol. x., page 196. 1850.

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* Guy's Hospital Reports, vol. vii., p. 105. † Med. Gaz. 1850, p. 229.

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* Medico-Chirurgical Review, vol vii., p. 257. 1851.

attributed to some of the surrounding tissues being engaged, for he has been unable to find nerves in cartilage; and Kölliker, without being aware of Dr. Redfern's experiments, has made a similar observation in his recently published Microscopic Anatomy. Here we have one of the many instances in which the microscope has been used to test assertions, which have too often, up to the present time, derived the reliance placed in them from the name of the individual by whom they were made. Having endeavoured to put prominently forward a few among the numerous cases where the microscope has been practically useful, it would now be my place to describe the instrument, but I refrain from so doing as its history can be found in any of the class-books, and its description forms part of the immediate subject of the Course, during which numerous opportunities of learning its manipulations will occur.

It must be apparent to every one, that before commencing the investigation of diseased structures, we should be acquainted with the minute normal anatomy of the solids and fluids that compose the body; for as disease consists in a variation from health, we cannot become cognizant of the existance of the former without being first aware of the state of the organs in the healthy condition; we therefore propose to devote part of this course to the demonstration of the structure of blood, secretions and solid parts, making thereon such remarks as will enable us better to understand the physiology of diseases; for in pathology no new law appears to exist, hence, diseased action may be considered as an increase or diminution of a normal process, or its occurrence out of its proper place, for a change which is normal in one organ would be abnormal in another;

we must then at times necessarily encroach on the territory of Physiology, for as has been ably put forward in a late review, "every experiment made by the Physiologist is really the induction of an abnormal or pathological condition, from which, as also from the phenomena of disease, he is enabled to deduce inferences which the most persevering observation of normal action would never have revealed to him; in the observation of disease we cannot ascertain what really are its phenomena unless we are acquainted with the normal actions of which they are perversions; nor can we make the least approach to any more than an empirical association of these phenomena, unless we are acquainted with the mode in which the healthy action of the organs which manifested them, are linked together."

We have thus seen that to make ourselves familiar with Pathological Anatomy, we must study long and observe accurately, but in order to make our observations understood by and useful to others, something more is required, and here an illustration will best explain my meaning. A student, examining an epithelium cell, wishes to describe what he has seen; he begins, "it is like a small bladder;" thus he is unconsciously theorising before he has stated the grounds on which his comparison is made; he continues, "it is like a small bladder, with something like dust in its interior;" theorising again—and how many different objects could be drawn, exhibiting bladders in every stage from complete collapse to full inflation, containing from one to a thousand particles of dust, all answering to the above description, and yet not one like the object observed? To give an accurate and distinct idea of any thing, our description must be such as would allow an exact image of the object to be drawn, as we relate its appearances; this can only be accomplished by having certain rules to guide us; these will, I trust, be clearly explained in the course, for a want of methodical description has too often rendered useless what would otherwise have been highly valuable—and if the study of Pathological Anatomy did nothing more than bring our observative faculties into exercise and teach us how to use them to the best advantage, it would form no mean element in disciplining the mind for the study of that profession, which requires for its successful practice acute observative powers, and a directly logical turn of mind—therefore, Fellow-students, this undertaking is a serious one, begun with diffidence, but in hope; on you depends the realization of that hope, and is it not a high and honourable one, and will you not lend me your earnest co-operation in this attempt to raise the character of the Irish School of Medicine, at the same time that you will be preparing yourselves for the honourable and scientific duties of your profession. Seniors in that profession, I would ask your assistance, such assistance as the experienced can give those who are entering on the rough road of investigation which leads to that true Mountain of Light, where Truth stands revealed by science. As fellow-labourers I ask your assistance—as friends your advice—well I know much is in your power, fully sensible am I of the value of your aid, and short indeed should be my memory did I forget that you were my instructors—help me then to teach others what has been taught to me.